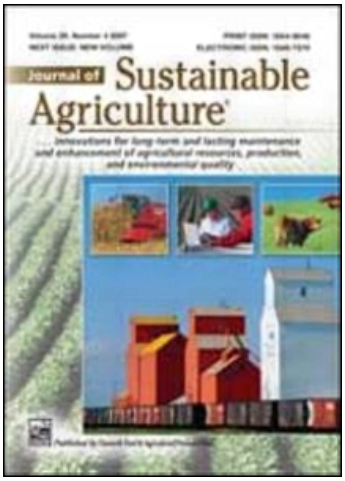

Journal of Sustainable Agriculture
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t792306915

Growing and Selling Pasture-Finished Beef: Results of a Nationwide Survey

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To cite this Article Lozier, John, Rayburn, Edward and Shaw, Jane(2005) 'Growing and Selling Pasture-Finished Beef: Results of a Nationwide Survey', Journal of Sustainable Agriculture, 25: 2, 93 — 112
To link to this Article: DOI: 10.1300/J064v25n02_08
URL: http://dx.doi.org/10.1300/J064v25n02_08

Growing and Selling Pasture-Finished Beef: Results of a Nationwide Survey

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ABSTRACT. This paper reports the results of a broad survey of 149 producers who identify their product as "pasture-finished" beef. Returns are from 46 different US states and Canada. Survey responses provide information on farm background characteristics, production systems, and marketing. Results show consensus on many points, and diversity on many others. The structure of the pasture-finished beef enterprise is built on direct marketing, niche marketing, source identification, value added, and rising consumer consciousness of health, environmental, and social benefits.

There is a need for more attention to the role of animal husbandry in sustainable agriculture. Recent years have seen renewed interest in grazing systems, and a growth in market demand for pasture-finished beef. This is can be seen in popular press and consumer trends.

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This report is a product of the "Pasture-Based Beef Systems for Appalachia" project [PBBSA], a multi-institutional collaboration among West Virginia University (WVU), U.S. Department of Agriculture's Agricultural Research Service (USDA-ARS), Virginia Tech (VT), and University of Georgia (UG).

The authors appreciate thoughtful reviews and helpful comments from Ronald Althouse, Cornelia Flora, Tom Lyson, Nancy Grudens Schuck, and Ray Poincelot. The authors have incorporated some, but not all of their suggestions. Of course, they are in no way responsible for any deficiencies that may remain.

Journal of Sustainable Agriculture, Vol. 25(2) 2004
http://www.haworthpress.com/web/JSA

Digital Object Identifier: 10.1300/J064v25n02_08

The industrial food system does not take good advantage of the natural characteristics of cattle. In traditional farming systems, cattle perform the useful work of harvesting and concentrating nutrients from outlying pasturelands and transporting them to the human homestead or household. Cattle grazing can be accomplished with minimal material and management inputs.

KEYWORDS. Beef, cattle, direct marketing, niche, pasture

There is a growing interest in pasture-based beef systems, from the viewpoints of both production and marketing. There is also a need for more attention to the role of animal husbandry in the enterprise mix of sustainable agriculture. This paper reports the results of a broad survey of US and Canadian producers who identify their product as "pasture-finished" beef. In addition to production and marketing, the survey collected information about farm and farmer characteristics. The broad American scope of this survey was undertaken as a preliminary to a continuing regional focus on Appalachian pasture-based beef producers and systems.

Cattle evolved as grazing animals. In traditional farming systems, they perform the useful work of harvesting and concentrating nutrients from outlying pasturelands and transporting them to the human homestead or household. Cattle work at a walking pace. In pre-industrial systems, they are even driven, walking, to market. With the development of industrial food systems, cattle are usually driven to market in trucks. But before going to market, they are transported to feedlots. There they are fattened on feed that has been mechanically harvested and carried to them. Beef's trip from farm to dinner plate has grown very long. It is not "walking distance."

This industrial system does not take advantage of the grazing animal's capacity to produce and deliver high-quality food materials with minimal input from farmers. Instead, high inputs of materials and energy, mined from the earth, are used for industrial food production. The commodity-based, global-industrial food system may remain productive for a few generations, but it is not sustainable over the long term.

Pioneering a renewed emphasis on grazing in sustainable animal production is a dedicated group of American "grass-farmers" (Nation,

1993). Popular press attention has been widespread from New York to San Francisco (Pollan, 2002; Burros, 2002; Severson, 2002; Kummer, 2003). Among consumers, there has been a concurrently growing interest in the nutritional characteristics of grass-fed animal products both in print (Robinson, 2000) and on the Worldwide Web, with regional marketing cooperatives emerging from New England (www.nelivestockalliance.com) to Hawaii (www.kamuelapride.com) and all points between (www.eatwild.com).

The structure of the pasture-finished beef enterprise is built on direct marketing, niche marketing, source identification, value added, and rising consumer consciousness of health, environmental, and social benefits. The hope is to develop a niche market for healthy and environmentally friendly "green" products: low in fat, tasty, high in nutritional qualities, and environmentally and socially benign. The economic prospects for pasture-finished beef are improved by rising input costs, growth of local and regional markets, and communication of the message to consumers.

Growing (producing) and selling (marketing) pasture-finished beef can be done in various ways. Some of these are revealed in results of a nationwide survey of 149 pasture-finished beef producers. This survey was designed and conducted by a team of collaborators at West Virginia University Extension Service. It is a part of a larger project, "Pasture-Based Beef Systems for Appalachia" (PBBSA), a multi-institutional collaboration among West Virginia University (WVU), The US Department of Agriculture's Agricultural Research Service (USDA-ARS), and Virginia Tech (VT), focusing on beef production ranging from calf to finished product. The project's mission is to develop practices to produce market-ready beef entirely on pasture and forage in the Appalachian Region.

METHODOLOGY

In early 2001, we generated a list of about 300 candidates for the survey through various means. About 250 came from Internet searches and listings (at www.eatwild.com). An additional group of about 50 came in response to announcements in *The Stockman Grass Farmer* and on a sustainable agriculture electronic mailing list (Sanet-MG). The survey was administered with the assistance of the WVU Survey Research Center. Respondents were given assurances of confidentiality, but were not anonymous. Survey forms were mostly sent out and returned by reg-

ular mail, but in a few cases respondents completed the questionnaire on-line at a Website established for the purpose. Regular mail returns were entered into the on-line database, by a combination of machine scoring and manual entry. One hundred and fifty-eight responses were tabulated, but nine of these were disqualified from this analysis because of statements showing that the systems did not meet our criterion for "pasture-finished" production (we allowed supplemental grain "on pasture," but not "in feedlot"). Thus, the number of cases reported here is 149. Several surveys were returned blank. Considering that some recipients may have disqualified themselves for use of grain, this suggests a rate of return above 50 percent of true pasture-finishing producers reached by the survey.

The purpose of this paper is primarily descriptive. Limited farm background information is provided to describe the sample. The main focus of the survey includes information on both production and marketing practices and activities.

Farm background information presented here includes location, years in production, and relative size of operation. Not reported here are qualitative responses to open-ended survey questions about goals and philosophy. Also to be reported separately are results of field visits and unstructured interviews with a subset of the survey respondents on more than 40 farms in the Appalachian region.

Production information includes breed selection, reproduction, health management, grazing systems, fertility management, forage species, use of supplements, and output. Information relates to four phases of production: calving, weaning, stocking (or growing), and finishing.

Marketing information includes slaughter practices (such as timing, grading, and aging) and also product packaging, customer base, advertising, and pricing.

Where averages are reported, the range of responses is indicated by showing the "plus or minus" range as represented by the standard deviation, not the actual range of scores. This statistic means that two-thirds of the sample is expected to fall within the range.

RESULTS

Farm Background Information

The 149 producers included in this survey report are located in 46 states and Canada, with concentrations of six or more producers in Col-

orado, Minnesota, Nebraska, Oregon, Pennsylvania, Texas, Virginia, and Wisconsin. Many producers are relatively new to the business of pasture-finishing; they reported an average of about 5 ± 3.8 years with a range from 1 to 20 years. About 54% described their operations as "small" in comparison with other local producers, while just 8% described themselves as "large." The remainder (38%) say they are "medium" in size.

Only 8% of these producers say they are "certified organic," while 11% say they are "not organic." The great bulk of these producers claimed to be "organic but not certified" (39%) or "not quite organic but close" (42%).

Production

Breed Selection, Reproduction, and Replacement. Most respondents in the survey produced both steers (87%) and heifers (74%), and about a third (33%) also produced bulls. Angus, Angus-cross, Hereford, and Hereford-cross breeds are favored as first choice by more than half of the respondents (Table 1). Other popular breeds are Galloway and Jersey. Beyond these breeds, it is interesting to note that many "specialty" breeds and crosses are used by just one or a few producers (e.g., Beefmaster, Bison, Holstein, Highland, Murray Gray, and others).

TABLE 1. Breed selection (first-named breeds)

	count	percent
Angus, Red Angus, Angus cross	56	39
Hereford, Hereford cross	21	14
Galloway, Belted G., Black G.	10	7
Jersey	9	6
Others (decreasing rank, 5 or fewer producers each):		
Beefmaster, Bison, Holstein (5 each × 3 = 15 producers)	45	29
Scotch Highland (4 producers);		
Simmental, Limousin, Murray Gray (3 each × 3 = 9 producers);		
Piedmontese, Belgian Blue, Dexter (2 each × 3 = 6 producers); Charolais, Black Baldy, Brahman, Senepol, Brangus, Beefalo, Belted Hereford, British White, Longhorn, Yak, generic "cross" (1 each × 11 = 11 producers)		
No info	8	5
Totals	149	100

TABLE 2. Source of replacement animals: do you . . .

	yes/no	percent
produce calves from your own cows?	126/23	85
purchase from others?	75/74	50
purchase from sale barn?	15/75	20
purchase directly off farms?	63/75	84
purchase from order buyer?	11/75	15

TABLE 3. When do you have your cows calving?

	count	percent
spring calving	93	74
fall calving	12	10
year-round calving	19	15
no info given	2	2
Totals	126	101

The great majority of respondents (85%) produce animals from their own cows, but about half of them also purchase animals for production (Table 2). Most purchases (84%) are made "directly off farms" rather than from sale barn, order buyer, or other sources.

About 74% of calf producers practice spring calving. About 10% practice fall calving, and the balance produce calves year-round (Table 3). Spring calving is concentrated in the months of March, April and May. Fall calving is concentrated in September (Table 4).

Criteria for Purchasing of Animals. Respondents were asked to rate the importance of various criteria (breed, weight, body condition, muscling, frame size, age, health management program) when purchasing animals (Table 5). Most producers rated all criteria as important. To calculate rank values for the criteria, a formula was used which multiplies the response value (1 through 5) by the percentage giving that response ($Y = a + 2b + 3c + 4d + 5e$, where a, b, c, d, and e are the percentages and the coefficients are the numerical ratings 1 to 5). By this formula, the most important criteria are breed, age, and health management program, followed by frame size, muscling, body condition, and weight.

Reported average age of animal at purchase ranges from a few days to more than 12 months (Table 6). Similarly, reported average weights

TABLE 4. Calving target months (seasonal calvers only)

	month	count	percent
"Spring calving"	January	1	1
	February	4	4
	March	20	20
	April	40	40
	May	15	15
	June	7	7
"Fall calving"	July	3	3
	August	3	3
	September	6	6
	October	0	0
	November	0	0
	December	0	0
Total seasonal calvers		99	99

TABLE 5. When buying animals, how important are the following criteria? (percent of N = 75, 1 = "not," 5 = "extremely")

	1	2	3	4	5
	%	%	%	%	%
breed (390)	3	9	15	41	32
age (388)	3	5	20	45	27
health management program (380)	8	11	17	21	43
frame size (361)	5	15	25	24	31
muscling (339)	4	11	42	28	15
body condition (327)	7	13	37	32	11
weight (310)	8	14	42	32	4

of animals at purchase range from under 100 pounds to 1,000 or more (Table 7). Both tables reflect diversity of respondents, whose operations range from the rearing of calves from dairy enterprises to the finishing of animals purchased at mature ages for the purpose of pasture-finishing.

TABLE 6. Average purchase age in months

	count	percent
1 or less	2	3
2	1	2
3	0	0
4	1	2
5	3	5
6	11	17
7	7	11
8	2	3
9	6	9
10	10	15
11	3	5
12 or more	19	29
Total	65	100

TABLE 7. Average purchase weight

	count	percent
Under 100 lbs	3	5
100-200 lbs	1	2
201-300 lbs	1	2
301-400 lbs	5	8
401-500 lbs	14	21
501-600 lbs	17	26
601-700 lbs	10	15
701-800 lbs	7	11
801-900 lbs	4	6
901-1000 lbs	2	3
Above 1000 lbs	2	3
Total	66	100

Health Management Practices. Respondents were asked whether they use seven different health management practices, shown in Table 8. More than half indicated they use dewormers (53%), vaccination (52%) and antibiotics for sick animals (52%). About 40% treat for fleas and lice, while much smaller numbers use feed additives (3%) and growth implants (1%). None use antibiotics as a feed additive.

TABLE 8. Health management program (N = 149): "Do you use . . ."

	count "yes"	percent "yes"
dewormer	79	53
treatment for flies and lice	59	40
vaccinations	78	52
feed additives–Rumensin, Bovatec, etc.	5	3
growth implants	2	1
antibiotics for sick animals	77	52
antibiotics as feed additive	0	0

Grazing Systems and Management. Respondents were asked to report expected dates for the start of spring grazing and winter-feeding. One hundred seven respondents provided a spring turnout date (Table 9), and 122 respondents provided a winter-feeding date (Table 10). March is the modal month for spring turnout, and November for commencement of winter-feeding. Respondents were not asked directly whether they practiced year-round grazing. This was an oversight. From available data, viewed another way, 42 respondents gave no spring turnout date, and 25 gave no fall feeding date. Also, 39 of 149 producers stated or implied in some way that their animals are "on pasture year-round." From these indications, we estimate that about one third of the survey respondents keep animals on pasture year-round, with or without supplemental feeding.

Respondents were asked to pick a phrase that described their grazing management system. Choices (shown in Table 11) were "continuous," "rotational," and "intensive rotational," with or without "varied acres or stocking rate." Out of 149 producers, only 9, or 6%, described their systems as continuous, while 94% called their systems rotational in one form or another. More than half indicated that they manage grazing to vary the effective stocking rate during the year.

Fertility Management. For providing nitrogen fertility, respondents were asked to rate three major methods: legumes, commercial fertilizer, and organic fertilizer. Each nitrogen source was rated separately for pasture and for hay on a 5-point scale. Results are shown in Table 12. Legumes are rated as important in both pasture and hay, but more so in pasture. Most producers rated commercial N as unimportant in both pasture and hay, but perhaps slightly more important in pasture than hay. These producers appear about evenly split regarding the impor-

TABLE 9. Spring grazing start date (month)

	count	percent
January	1	1
February	26	24
March	58	54
April	20	19
May	1	1
June	1	1
Total	107	100

TABLE 10. Fall feeding start date (month)

	count	percent
August	1	1
September	5	4
October	23	19
November	44	36
December	38	31
January	11	9
Total	122	100

TABLE 11. Grazing management system

	count	percent
continuous	4	3
continuous but vary acres or stocking	5	3
rotational	26	17
rational and vary acres or stocking	31	21
intensive rotational	26	17
intensive rotational and vary acres or stocking	52	35
other	5	3
Total	149	100

tance of organic N, with perhaps a bit more importance in pasture than in hay.

Respondents were asked to rate the importance of various specific forages and forage combinations (Table 13). Responses were diverse, as expected due to diversity of climate and systems among the group of producers. By a wide margin, cool-season grass-clover mix was the most important (first-ranked) forage combination. Perennial warm-season grasses, alfalfa, and "other legumes" ranked 2, 3, and 4. Some of the

TABLE 12. Nitrogen sources (and rank value scores): How important are the following . . . (1 = "not," 5 = "extremely") (sample size 115-144)

	1	2	3	4	5
	%	%	%	%	%
legumes in pasture (427)	5	4	7	27	57
legumes in hay (343)	13	12	23	23	29
organic N in pasture (314)	25	9	15	24	26
organic N in hay (251)	45	7	18	17	14
commercial N in pasture (186)	62	11	13	7	7
commercial N in hay (151)	74	8	10	4	3

TABLE 13. Forages (and scores): "How important are the following forages in your system? (1 = "not," 5 = "extremely")

	1	2	3	4	5
	%	%	%	%	%
cool-season grass and clover (340)	5	2	7	20	66
perennial warm-season grasses (201)	33	11	9	16	31
alfalfa (152)	39	14	16	18	13
other legumes (147)	44	13	13	12	18
other forages (147)	16	43	16	24	0
annual warm-season grasses (137)	47	11	15	12	15
N-fertilized cool-season grasses (124)	50	13	13	11	13
stockpiled tall fescue (125)	50	11	13	12	13
small grains (103)	57	13	10	14	7
corn silage (23)	90	3	4	4	0

"other legumes" listed by respondents (at least 2 mentions) include birdsfoot trefoil, white and red clover, lespedeza, vetch, crimson clover, and peas.

A category of "other forages" was ranked at fifth place. Some of these are brassicas, turnips, sorghum-Sudan grass, rye grass, crab grass, chicory, bluegrass, corn, dandelion, forbs, millet, orchard grass, timothy, and triticale.

Annual warm-season grasses ranked sixth, ahead of N-fertilized cool-season grasses (seventh) and stockpiled tall fescue (eighth). Next, at ninth, came various "small grains" including (at least 2 mentions) rye, wheat, oats, triticale, rye grasses, and spelt.

Reflecting the unity of this group of pasture-finishing producers, corn silage ranked last (tenth), rated "not important" by 90% of the sample.

Supplementation. Most producers in this group do not provide supplementary energy or protein to cows or to calf/yearlings. As shown in Table 14, these practices are followed by about 1/4 to 1/3 of this sample of producers.

Finishing and Processing. Finishing is the period of weeks during which the animal is brought into slaughter condition. Finishing requires high-quality animal nutrition. This is provided by grain in feedlot production. Finishing on pasture is generally managed by providing abundant free-choice access to the producer's highest quality pasture. Alternatively, producers sometimes provide supplementary grain while grazing continues. In our sample, 20 producers (14%) reported that they finish with supplementary grain on pasture (Table 15). Among those 20 cases, reported duration of grain-feeding averaged 45 ± 14 days, and daily ration averaged 7.4 ± 3.2 pounds.

Respondents were asked to rate the importance of various criteria for the decision to send an animal to slaughter. Body condition and weight are the first and second criteria, followed by age and time of year (Table

TABLE 14. "Do you provide supplementary . . . "

	yes/no	percent "yes"
energy to cows?	31/110	22
protein to cows?	38/103	27
energy to calf/yearling?	43/98	30
protein to calf/yearling?	41/96	30

TABLE 15. During finishing, do you provide supplementary grain on pasture?

			count	percent
yes			20	14
no			124	86
Total			144	100
	mean	sd		
days of grain on pasture, 20 cases	45	14		
lbs/day, 20 cases	7.39	3.2		

TABLE 16. Criteria for slaughter decision (and rank value scores): "How important is . . ." (1 = "not," 5 = "extremely")

	1	2	3	4	5
	%	%	%	%	%
body condition (426)	2	3	11	30	53
weight (357)	5	16	26	28	26
age (346)	4	16	29	27	23
time of year (342)	13	17	13	24	32

TABLE 17. Animal characteristics at slaughter

	Mean	S. D.
Typical age at slaughter (months)	20.8	6.77
Typical weight at slaughter (lbs)	980	167

16). As shown in Table 17, reported typical age at slaughter averages 21 ± 6.8 months; average weight at slaughter is 980 ± 170 pounds.

Most producers (59%) use federally inspected slaughter facilities, while a minority (44%) use state-inspected facilities (Table 18). Also, about a third (32%) of producers reported that they sometimes sell live animals to customers who make their own slaughter arrangements. Numbers add to more than 100% because respondents were permitted to mark more than one answer. Most producers do not have their product graded for yield or quality by USDA (Table 19).

Traditionally, after slaughter, carcasses have been hung or aged for some days before cutting, but this practice has been eliminated in modern industrial meat production. As shown in Table 20, the practice of aging (hanging) is virtually universal among our sample of producers. About 94% of respondents reported hanging or aging the carcasses. The average number of days is 14 ± 3.7 (Table 21).

As a group, these producers slaughter in all 12 months of the year, with peaks in July and October and lowest frequencies in February, March, and April (Table 22). As individuals, many respondents target their annual production for slaughter in a certain month or season rather than year-round.

TABLE 18. Inspection of slaughter: "Are your animals slaughtered under . . ." (N = 149)

	yes	percent
state inspection?	60	40
federal inspection?	85	57
sold live?	45	30

TABLE 19. USDA grading: "Are your carcasses graded for . . ."

	yes/no	percent yes
USDA quality	8/144	6
USDA yield	5/146	3

TABLE 20. "Are your carcasses aged before cutting?"

	count	percent
yes	140	94
no	2	1
no info	7	5
Totals	149	100

Marketing

Marketing is a term that covers a wide range of activities, beginning with the naming or identification of a product. Asked to describe their products, respondents gave a great many "key words" and phrases (Table 23). Topping the list are such terms as grass-fed or pasture-finished; natural, organic; hormone-free, drug-free, antibiotic-free; lean; healthy; low-fat; local; humane, flavorful; tender; and clean. Many respondents also came up with unique ways to describe their operations, including compassionate; grass-fat; happy cows; heart-healthy; known history; no confinement; and no stress. These creative descriptions show an emerging definition of a market niche for pasture-finished beef.

Asked "Do you sell seasonally or year-round," this group gave about evenly divided responses (Table 24). Selling year-round does not nec-

TABLE 21. "How long are carcasses aged?"

	count	percent
3-7 days	14	10
8-14 days	86	62
15-21 days	32	23
21+ days	6	4
Total	138	100
average # of days: 14; Standard Deviation: 3.7		

TABLE 22. Distribution of slaughter across months (N = 149)

	count	percent
January	39	26
February	31	21
March	28	19
April	36	24
May	43	29
June	61	41
July	54	36
August	44	30
September	72	48
October	94	63
November	82	55
December	51	34

essarily imply year-round slaughter; because many producers hold frozen products for year-round distribution.

Selling involves establishing contact with consumers or clientele. As shown in Table 25, 95% reported selling "to individuals." Also, 28% reported sales to "independent stores or butcher shops," and lower numbers reported sales to restaurants (16%), wholesalers (8%), and chain supermarkets (5%).

For any marketing, especially direct marketing, the form or packaging of the product is important. Table 26 shows that these producers

TABLE 23. "What key words do you use to describe your product?" (N = 149)

	count	percent
grass-fed, grass-finished, pasture-finished, pasture-raised, free-range, pastured, forage-fed, pasture-fed, etc.	84	56
natural	43	29
antibiotic-free, drug-free	37	25
hormone-free, chemical-free	35	23
flavorful, tasty, juicy, delicious	33	22
healthy, wholesome, nutritious, low-fat	30	20
local, home-grown	27	18
organic	24	16
humane, stress-free, etc.	22	15
lean	15	10
tender	12	8
clean	7	5
Other terms used by less than 5%: environmentally friendly, fresh, holistic, salad-bar beef, sustainable, dry-aged, predator-friendly, sweet, biologically raised, compassionate, good, grass-lean, happy cows, heart-healthy, known history, more edible pounds per pound bought, no animal proteins, no confinement, no feedlots, no force feeding, no herbicides, no radiation, raised God's way, robust, safe.		

market their beef in a wide diversity of forms: sides (74%); split sides (58%); hamburger (54%), individual cuts (53%); whole carcasses (49%); quarters (42%); different-size boxes (18%); and boxed with different value cuts in box (17%).

Direct marketing is a strategy for profitability that depends upon capturing a larger share of the retail dollar, with or without a consumer price premium. To determine whether there is a price premium, the survey asked respondents to compare their own hanging carcass prices to the overall local market (Table 27). About 83% of respondents said that they obtain a premium price, with 25% reporting a premium of 75 cents per pound or more.

Asked "How do you advertise," 99% checked "word of mouth." In addition, 45% reported they have Web sites; 34% use direct mail; 27% use newspapers or magazines; 20% use e-mail advertising; and 9% use radio and/or television (Table 28).

TABLE 24. “Do you sell seasonally or year-round?”

	count	percent
seasonal	76	52
year-round	69	48
Totals	145	100

TABLE 25. “Who do you sell to?”

	count	percent
local individuals	142	95
independent stores	42	28
chain supermarkets	8	5
restaurants	24	16
year-round wholesalers	11	7
other	26	17

TABLE 26. “In what form do you sell your product?”

	count	percent
live animal	45	30
whole carcass	71	48
whole side	110	74
quarter	63	42
split side or mixed quarter	85	57
box–different sized	27	18
box–different value cuts in box	24	16
individual cut	79	53
hamburger	81	54
other	10	7

DISCUSSION

Summary of Survey Results. Our data demonstrate considerable diversity among pasture-finished beef producers, but also of some strong similarities on key points. This discussion presents a review of some of the main points as set forth earlier.

TABLE 27. Price premium: "How do your hanging carcass prices compare to overall . . . prices?"

	count	percent
75 cents or more higher per pound	32	26
50-74 cents higher	24	19
25-49 cents higher	47	38
about the same	18	15
below market	3	2
Totals	124	100

TABLE 28. "How do you advertise?"

	count	percent
word-of-mouth	148	99
radio-tv ad	12	8
newspaper or magazine ad	37	25
website	64	43
e-mail	30	20
direct mail	51	34
other	41	28

Let us take the criterion of 80% agreement as an indication of strong consensus or similarity. At the same time, let us consider single responses in the range of 20 to 50% as reflecting significant diversity.

By these criteria, our sample of pasture-finishing producers are diverse in terms of breed selection. Many farms produce specialty breeds, while others use the more popular Angus and Hereford. Our sampled producers are similar in that they obtain replacement calves primarily by own calving, but diverse in that some also purchase animals for finishing. When purchasing animals, preferences are diverse, ranging from newborn calves to mature stockers.

The producers in our sample are similar in that they do not use certain health management practices associated with industrial animal production (feed additives, growth implants, and antibiotics as a feed additive); but they are diverse in terms of other health management practices (dewormers, fly and lice treatment, vaccinations, antibiotics for sick animals). They are similar in describing their grazing systems as "rotational," but diverse in terms of whether they practice "varied stocking

rate." With regard to nitrogen sources, the data can be interpreted to suggest that the producers in our sample are similar in relying upon legumes rather than commercial nitrogen, but diverse with respect to use of organic N (animal manure). Data on use of supplementation (energy and protein) show these producers to be diverse, but they are similar in that they do not generally feed grain.

The sampled producers are strongly similar in the practice of aging, or hanging the carcasses before cutting, thereby distinguishing themselves sharply from industrial meat producers. In terms of marketing, the keywords used to describe the product are quite diverse, although a typical description might include "grass-fed" and "natural" along with reference to drug- and chemical-free production, good flavor and nutrition, and local or home-grown production. These producers are similar in that they target local individuals as customers, but not chain supermarkets or wholesalers. They are diverse in that some also sell to independent stores and restaurants.

These producers are diverse in terms of the form of their product, ranging from whole live animals and whole carcasses through sides and smaller mixed packages. They are similar in that they claim to receive some degree of price premium. They are similar in relying heavily on word-of-mouth for advertising, but otherwise diverse in their advertising strategies.

Implications and Prospects. Our survey data suggest a substantial producer and consumer interest in pasture-finished beef. This interest arises in large part, we believe, from a public concern for environmental, social and economic sustainability in the food and farming system. Cattle and other animals fit into agricultural systems in a rich variety of different ways. The industrial food system does not take good advantage of the natural characteristics of cattle, particularly their ability to thrive on human-inedible forage and to save on machinery and transportation costs by grazing and by walking from place to place. With rising energy and transportation costs, these natural characteristics tend to give local and direct marketing an economic edge. Increasingly, consumers may come to recognize that local food systems offer significant environmental, social, and even national security advantages over the global-industrial commodity system.

This report shows a considerable degree of consensus on the meaning of grass-finishing, but also considerable diversity regarding some finer points. The purest of grass-finishers feed only grass and hay from birth, and avoid all feed additives, commercial fertilizers, and health treatments. Others are more inclined to compromise, for example, using calves of unknown background, vaccinating, and feeding supplements

and even grain. The fundamental agreement is the commitment to using grass as a replacement for all or almost all of the grain used in feedlot finishing. The currently state of the art and science of grass-farming continues to develop.

The pasture-finishing process is flexible and adaptable to a range of natural, social and economic resources that may be available in a particular location. Whether it is suitable for a particular farm operation depends on many factors. Each farmer and each farm is unique. Is this farmer committed full-time or part-time? Are farm resources relatively ample or limited? Are there farm enterprises other than pasture-finished beef, and what are they? Are marketing efforts more or less developed, and how? Asking such questions is an ethnographic task, which has been incorporated in the PBBSA Project in qualitative interview data and in case studies at local and individual farm scale. A draft manuscript on the decision to finish beef on pasture is Lozier et al. (accepted with revision). Additional case studies at the local and individual farm scale are also in preparation.

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RECEIVED: 06/20/03
REVISED: 10/17/03
ACCEPTED: 10/30/03